

WHAT IS CLAIMED IS:

1. A router device adding unique header information to a packet within said device in processing said packet, said router device comprising:

packet control means for adding said header  
5 information to said packet, said header information including at least an in-device priority mode for representing priority in said device, an in-device discard level for representing a probability of discard in said device, and a queue number for performing  
10 bandwidth control,

wherein said header information is used to perform priority control.

2. The router device according to claim 1, wherein said in-device priority and said in-device discard level are used in said device to realize differentiated services and a value of said output queue number is designated.

3. The router device according to claim 2, wherein said packet control means converts a packet input thereto into an in-device cell in a form in said device, and adds said header information to said in-device cell.

4. The router device according to claim 1, further comprising:

flow identifying means for detecting a flow which is a set of packets having a certain property from packets

5 input to said device;

flow rate monitoring means for detecting whether a previously determined bandwidth under control is violated for each said flow; and

forwarding searching means for determining, from  
10 contents of said packet, output line information indicating from which line said packet is to be output, wherein said packet control means creates and adds said header information based on flow information detected by said flow identifying means, information  
15 detected by said flow rate monitoring means, and output line information determined by said forwarding searching means.

5. The router device according to claim 4, wherein said flow rate monitoring means detects whether actual traffic matches, temporarily violates, or completely violates the previously determined bandwidth under contract for each said flow.

6. The router device according to claim 1, further comprising:

an input side in-device cell buffer for temporarily storing said in-device cell;

- 5        an output side in-device cell buffer provided corresponding to an output line for temporarily storing said in-device cell; and

switching means for switching said in-device cell stored in said input side in-device cell buffer to said  
10 output side in-device cell buffer,

wherein said input side in-device cell buffer, said output side in-device cell buffer, and said switching means are controlled on the basis of said header information.

7.    A method of controlling priority for a router device adding unique header information to a packet within said device in processing said packet, said method comprising the steps of:

- 5        adding said header information to said packet, said header information including at least an in-device priority mode for representing priority in said device, an in-device discard level for representing a probability of discard in said device, and a queue number for  
10 performing bandwidth control; and

using said header information to perform priority control.

8. The method of controlling priority according to claim 7, wherein said in-device priority and said in-device discard level are used to realize differentiated services and a value of said output queue number is  
5 designated.

9. The method of controlling priority according to claim 8, wherein an input packet is converted into an in-device cell in a form in said device, and said header information is added to said in-device cell.

10. The method of controlling priority according to claim 7, wherein said header information is created and added on the basis of information obtained by using the steps of: detecting a flow which is a set of packets  
5 having a certain property from packets input to said device, detecting whether a previously determined bandwidth under control is violated for each said flow, and determining, from contents of said packet, output line information indicating from which line said packet  
10 is to be output.

11. The method of controlling priority according to claim 10, wherein the step of detecting whether a previously determined bandwidth under control is violated for each said flow detects whether actual traffic

5 matches, temporarily violates, or completely violates the previously determined bandwidth under contract for each said flow.

12. The method of controlling priority according to claim 7, wherein the step of using said header information to perform priority control, further comprising the steps of:

5 temporarily storing said in-device cell to an input side in-device cell buffer;

temporarily storing said in-device cell to an output side in-device cell buffer provided corresponding to an output line; and

10 switching said in-device cell stored in said input side in-device cell buffer to said output side in-device cell buffer.